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# SCIENCE.

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FRIDAY, APRIL 4, 1884.

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## *COMMENT AND CRITICISM.*

Two bills are before Congress for the better administration of the naval observatory. One places the control of the observatory in the hands of a board, under the secretary of the navy, consisting of the superintendent, the senior line officer attached to the observatory, and the four senior professors of mathematics actually engaged in astronomical work at the observatory: the other is intended to give the positions of assistant astronomers that attraction in the way of promise of promotion necessary to induce young men to enter on the work, looking upon it as a permanency, and not as a make-shift till something better may turn up. It appears that in the past twenty-two years, from the corps of three assistant astronomers, there have been eleven resignations and only four promotions, and of the latter only one in the last nineteen years. It would seem that these bills are both in the direction of placing the working of the observatory on a more permanent footing, and of making it less subject to interruption from changes in the corps of observers, as well as a step towards giving the direction of the scientific work of the institution into the hands of those capable of making it tell better than in the past.

A RECENT statistical inquiry into the working of the system of German universities during the last half-century, is a model of painstaking research and accuracy. The author is Dr. I. Conrad of Halle, well known as a professor of political science; and the volume before us is the fifteenth paper in a series of studies produced, under his direction, by the seminary at Halle, of which he is the director. We might almost as well endeavor to cull interesting facts from a volume

of the census as to draw from these pages, crowded with statistical tables, and illustrated by numerous diagrams, examples of the important and curious lessons brought out by this study. One fact, however, is so patent, and is such an index of the social condition of Germany, that it is worth mentioning. During the last thirty years the attendance on the seven universities of old Prussia has enormously increased, and especially since 1874, when there was a brief temporary retrograde. All the faculties, except that of Roman-catholic theology, show this increase; but that of philosophy has gained far the most, as might indeed be surmised from the growth of modern departments of scientific instruction. In all the universities of Germany, similar progress may be seen. In the decade prior to 1850 (the period of 1848) there was a diminution in the aggregate attendance; in the next two decades there was a slight increase: but since 1870 the number of students has rapidly augmented. Philosophy has gained most, law next, medicine next, and then protestant theology. Catholic theology alone has less followers in these institutions than it had twenty years ago. A summary carefully prepared, of these two hundred and fifty pages, would make an excellent contribution to an American journal of education. A kindred study of the attendance upon American colleges, such as Dr. Barnard of Columbia college initiated a few years ago, would make an admirable basis for the inquiries now in progress as to possible improvements in our institutions of learning. Is there not some agency in this country by which this investigation may be promoted?

THERE has not yet appeared any good and trustworthy illustration of a tornado at work, in spite of the comparatively common occurrence of these storms within sight of many observers. This is natural enough, to be sure; for in addition to the difficulty of the subject,

as may be inferred from the generally poor representation of clouds in woodcuts and other illustrations, there must be quite enough besides sketching to occupy one's mind while a tornado is sweeping past. But now that Mr. Finley has shown that a tornado will almost certainly be harmless when seen in the south-east, is it too much to hope that some well-trained, artistic, and self-possessed observer may secure drawings of the swinging funnel-cloud in its several phases, from which finished and characteristic illustrations can be made at leisure afterwards? A house or tree of known height, and at known distance, would give a unit of angular measure from which the altitude and diameter of the funnel could be determined after the distance to the ordinarily well-marked track is discovered. We should be indeed very glad, if the coming summer were to pass by without visits from tornadoes; but if they come, as is most likely, let as much be found out about them as possible. Water-spouts are in the same need of good portraiture, and an observant voyager in equatorial seas can do good service by bringing home accurate pictures of them. Is there not here a good opportunity for the numerous amateur photographers to turn their experimentation to good purpose? A series of instantaneous photographs would be especially interesting?

A NEW motor is said to have been brought out in New-York City, that hot-bed of schemes for making money out of the unwary. It is a new form of bisulphide-of-carbon engine, this time, which is to revolutionize the world, and the stock of which is offered for sale, to the fortunate who are admitted to the 'ground-floor,' at prices enormously below its real value, giving an opportunity to those favored ones to make the 'millions' that are undoubtedly in it. We are told of a triple thermic motor which is operated by the odorous fluid, and which is expected by the enthusiastic believers in the wonderful invention to give "three times as much power from a steam-boiler used to evaporate the vapor as could be obtained from the same boiler by means of a

steam-engine." It is said that large sums have been paid for the stock of the new company operating this machine by the ignorant capitalist, who, sharp as he is when 'working his points' in Wall Street, — not having even the intelligence of the man who acted as his own lawyer, and seldom thinking of consulting an engineer of known integrity and good professional standing, in a matter which demands at least the rudiments of an ordinary scientific training, — is often gulled with startling ease by the venders of 'Keeley motors,' and promoters of similar schemes.

THE hydrographic office of our navy department has lately issued the first numbers of a set of monthly meteorological charts of the North Atlantic, containing the results of many thousand observations on the winds and other atmospheric phenomena in form for giving practical information to the navigator. These are not to be confounded with the monthly pilot-charts begun in December last, of which mention has already been made in our columns, but are vastly more thorough. Indeed, the two series have about the relation to each other that weather has to climate. One is designed chiefly to spread information concerning recent changes in lights, buoys, etc., and to gather and record temporary conditions of the ocean: the other aims to give in detail the average and consequently permanent elements of maritime meteorology for every five degrees square of the ocean and for every month. The charts now published are for March, April, and May: the rest of the set will probably follow in the course of the year. Every one interested in the growth of our mercantile marine, as well as in the improvement of our navy, must rejoice to see this action of the hydrographic office toward the maintenance of the wide reputation for meteorological work on the ocean, well earned in Lieut. Maury's time; and we trust that the series of charts now begun for the North Atlantic may be followed by others of equal detail for the other oceans, towards which a great amount of available material has been accumulated.